BISS Biodiversity Information Science and Standards

Biodiversity Information Science and Standards 8: e142407
doi: 10.3897/biss.8.142407

OPEN ACCESS

Conference Abstract

A Dry Collection Talk: Revitalizing the San Diego Natural History Museum Marine Invertebrate Collection

Pamela J Horsley[‡], Christiana R Mojica[‡], Kesler A Randall[‡], Thomas A Demere[‡], Christina N Piotrowski[§], Charlotte A Seid[|], Lindsey T Groves[¶]

‡ San Diego Natural History Museum, San Diego, United States of America
§ California Academy of Sciences, San Francisco, United States of America
| University of California San Diego, La Jolla, United States of America
¶ Natural History Museum of Los Angeles County, Los Angeles, United States of America

Corresponding author: Pamela J Horsley (phorsley@sdnhm.org)

Received: 21 Nov 2024 | Published: 22 Nov 2024

Citation: Horsley P, Mojica C, Randall K, Demere T, Piotrowski C, Seid C, Groves L (2024) A Dry Collection Talk: Revitalizing the San Diego Natural History Museum Marine Invertebrate Collection. Biodiversity Information Science and Standards 8: e142407. https://doi.org/10.3897/biss.8.142407

Abstract

In 2021, the San Diego Natural History Museum (SDNHM) received funding from the US Institute of Museum and Library Services (IMLS) to improve the condition, management, and accessibility of the dry Marine Invertebrate Collection (IMLS MA-249928-OMS-21). The collection is one of the oldest at the museum and dates back to the founding of the San Diego Society of Natural History in 1874. It is a large, dry collection of primarily gastropods and bivalves and is estimated to contain nearly five million specimens in over 91,000 specimen lots, which include 135 holotypes and 856 paratypes. The collection has lacked dedicated staff for nearly 25 years and suffered from data inaccessibility and inadequate physical and taxonomic curation (Fig. 1). However, this project attempts to mitigate previous issues through increased staff dedication, specimen digitization, collection analysis, and rehousing.

© Horsley P et al. This is an open access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Figure 1.

Collection drawers illustrating variable and sometimes inappropriately sized vial/tray system (A), overcrowded drawers (B), and inefficiently packed drawers with poor stabilization of trays (C). © San Diego Natural History Museum.

The research value of the collection cannot be overstated, both in terms of geographic and temporal uniqueness. While the collection is worldwide in representation, it houses some of the earliest known collections from the museum's focal region: southern California and the peninsula of Baja California. The collection also houses an important regional collection of land snails, perhaps the most impacted fauna of the current mass extinction (Cowie et al. 2017, Regnier et al. 2009).

Historically, each specimen lot in the collection was recorded on a paper catalog card (Fig. 2). After scanning all cards, Optical Character Recognition (OCR) was employed with moderate results. The OCR dataset required large-scale data cleaning in Microsoft Excel to produce an initial digital dataset. Iterative bulk updates to select fields using data keys helped minimize the number of fields for manual review. Manual review of remaining fields for each database record was completed by trained volunteers. This approach maximized our dataset's quality and culminated in the collection's first publicly accessible digital specimen catalog. The SDNHM Marine Invertebrate Collection records can be found online via InvertEBase-Symbiota portal (Gries et al. 2014).

Using the digitized collection records, data analyses yielded an incredible geographic spread, extreme data quality disparities, many unlabeled specimens and outdated scientific names. Approximately 20% of catalog cards and their associated digital records lack scientific names. But for a majority of these specimens, the determination exists either as a name on the in-drawer card or the card is unlabeled but within an identified species grouping in the drawer. Thousands of specimens have been updated through this process already and are now also digitally discoverable. A tree map was generated to graphically show the relative proportion of localities based on number of species lots (Fig. 3). There are specimens from every state in the United States and from nearly every country in the world. However, the collection spread is shallow, with the mean number of records per country only 29. A number of records contain only vague

locality information. Approximately 5% of records don't have country information and include very general data like "Pacific Ocean", while 16% of records have only country level information. Lastly, only about 30% of the collection records have associated collection dates. In an attempt to improve this data weakness, collector "date bands" based on birth and death dates are added to the dataset allowing for certain kinds of scientific studies.

Figure 2.

Example of historic catalog cards used in the the SDNHM Marine Invertebrate Collection. © San Diego Natural History Museum.

Alongside digital advancements, this project improved physical storage through the purchase of more space-efficient cabinets and replacement of wood drawers, and increased accessibility by expediting specimen retrieval through drawer reorganization, labeling with updated scientific names, and creation of an efficient specimen locator system Fig. 4.

This project provides the foundation for future curatorial and scholarly work in the collection, through enhanced collection accessibility and ease-of-use. A refined triage strategy informed by the digitized collection and aided by organizational improvements of this project will guide upcoming efforts for potential deaccession of irrelevant materials. We are exploring collaborations with other institutions and research initiatives to maximize the scientific impact of the collection. The SDNHM is now positioned to reintroduce its Marine Invertebrate Collection as a leading, efficient, and lasting resource.

Keywords

malacology, accessibility, digitization, collection management

Figure 3.

Tree map of the geographical composition of the SDNHM Marine Invertebrate Collection, labeled with the number of specimen records for each category. The United States is subdivided by state and demarcated within a dashed bounding box. The top ten countries for number of specimen records (including records lacking country-level information as “BLANK”) are within the red bounding box. Proposed prioritities for deaccessioning are starred.

Figure 4.

Rehousing and curation of portions of the collection. Species were consolidated from various drawers and cabinets throughout the collection and species were organized alphabetically by family. Vial orientation was standardized and included easy-to-read vials. Many flags had outdated species names and were hand-written, so new updated flags were printed. © San Diego Natural History Museum.

Presenting author

Pamela J. Horsley

Presented at

SPNHC-TDWG 2024

Acknowledgements

This project would not have been possible without the generous funding provided by IMLS. Heartfelt thanks to the members of the project advisory committee and the institutions they represent. The SDNHM project team appreciates their invaluable expertise that contributed to the success of this project.

Funding program

Institute of Library and Museum Services - Museums for America (IMLS MA-249928-OMS-21)

Grant title

Malacology Collection Stewardship: Increasing Access to 5 Million Specimens

Conflicts of interest

The authors have declared that no competing interests exist.

References

- Cowie RH, Regnier C, Fontaine B, Bouchet P (2017) Measuring the Sixth Extinction: what do mollusks tell us? Nautilus 131 (1): 3-41. [In English]. URL: https://www.biodiversitylibrary.org/page/59337187#page/7/mode/1up
- Gries C, Gilbert E, Franz N (2014) Symbiota – A virtual platform for creating voucher-based biodiversity information communities. Biodiversity Data Journal 2 https://doi.org/10.3897/bdj.2.e1114
- Regnier C, Fontaine B, Bouchet P (2009) Not Knowing, Not Recording, Not Listing: Numerous Unnoticed Mollusk Extinctions. Conservation Biology 23 (5): 1214-1221. https://doi.org/10.1111/j.1523-1739.2009.01245.x